nanoEHS

Nanomaterials and Human Health &
Instrumentation, Metrology, and Analytical Methods
November 17-18, 2009 – Holiday Inn Rosslyn at Key Bridge
1900 North Fort Myer Drive, Arlington, VA 703-807-2000
Metro: blue or orange line to Rosslyn Station
www.nano.gov/html/meetings/humanhealth/

[Provisional Agenda, 11/09/2009]

Monday, November 16, 2009

7:00 p.m. – 8:30 p.m. **Nanotechnology Primer – Nano101**

In conjunction with this workshop, the NNI presents a 90-minute overview and discussion of nanotechnology and nanoscale science for interested participants. To register for this event please send an email to humanhealth@nnco.nano.gov with your name and contact information and the subject line "Nano Primer."

Tuesday, November 17, 2009

7:30 **Registration & Continental Breakfast** *(location: Promenade, 2nd floor)*

8:30 – 12:00 **Morning Session** *(location: Rosslyn Ballroom)*

Welcome and Expectations for the Workshop–

Diane Poster, NIST

Clayton Teague, Director of the National Nanotechnology Coordination Office

Plenary Session

Chair – Steve Roberts, University of Florida

Three presentations to set the stage for the workshop, identifying the critical issues and providing common knowledge and language.

Characterization of engineered nanomaterials
– **Eric Grulke**, University of Kentucky

Biological *in vitro* interactions of engineered nanomaterials
– **David Grainger**, University of Utah

Break

Biological *in vivo* interactions of engineered nanomaterials
– **Martin Philbert**, University of Michigan

Charge to breakouts – Sally Tinkle, NIEHS

12:00 **Lunch** *(on your own)*

1:30-4:15 **Concurrent Breakout Sessions**

Participants will probe the state-of-the-science and identify gaps and emerging trends as they relate to the research needs identified in the Federal nanoEHS strategy.

Session 1: Characterization
Co-chairs – Amit Kulkarni (GE Global Research) and Scott McNeil (NCL)

I1. Develop methods to detect nanomaterials in biological matrices, the environment and the workplace
I2. Understand how chemical and physical modifications affect the properties of nanomaterials
I3. Develop methods for standardizing assessment of particle size, size distribution, shape, structure, and surface area
I4. Develop certified reference materials for chemical and physical characterization of nanomaterials
I5. Develop methods to characterize a nanomaterial's spatio-chemical composition, purity, and heterogeneity
H2. Develop methods to quantify and characterize exposure to nanomaterials and characterize nanomaterials in biological matrices

Session 2: *In vitro* – biological – associated instrumentation
Co-Chairs – Carolyn Cairns (Consumers Union) and Andrew Maynard (Woodrow Wilson Center for International Scholars)

I1. Develop methods to detect nanomaterials in biological matrices, the environment and the workplace
- is this important to understanding hazard to human health
- will we get the data we need to complete this research need (e.g., do we have the tool(s) we need?)

I2. Understand how chemical and physical modifications affect the properties of nanomaterials
H3.Identify or develop appropriate in vitro [and in vivo] assays/models to predict *in vivo* human response to nanomaterials exposure
H5. Determine the mechanisms of interaction between nanomaterials and the body at the molecular, cellular, and tissular levels

Session 3: *In vivo* – biological – associated instrumentation
Co-Chairs Bill Kojola (AFL-CIO) and Rick Pleus (Intertox)

I1. Develop methods to detect nanomaterials in biological matrices, the environment and the workplace
- is this important to understanding hazard to human health
- will we get the data we need to complete this research need (e.g., do we have the tool(s) we need?)

I2. Understand how chemical and physical modifications affect the properties of nanomaterials
H1.Understand the absorption and transport of nanomaterials throughout the human body
H2.Develop methods to quantify and characterize exposure to nanomaterials and characterize nanomaterials in biological matrices
H4.Understand the relationship between the properties of nanomaterials and uptake via the respiratory or digestive tracts or through the eyes or skin, and assess body burden
H5. Determine the mechanisms of interaction between nanomaterials and the body at the molecular, cellular, and tissular levels

4:30 – 5:00 **Invited Presentation** *(location: Rosslyn Ballroom)*
Introduction by **Travis Earles**, OSTP

The White House Perspective on Nanotechnology Health and Safety
Tom Kalil, White House Office of Science and Technology Policy (invited)

5:00 **Reception** *(Light Hors d'oeuvres and Cash Bar, outside Rosslyn Ballroom)*

Wednesday, November 18, 2009

7:30 **Registration & Continental Breakfast** *(location: Promenade, 2nd floor)*

8:30 – 10:30 **Morning Session** *(location: Rosslyn Ballroom)*

Welcome & Logistics for the Day – Dianne Poster, NIST

Report out from Session Rapporteurs – Introductions by **Heather Evans**, NNCO

Case Studies Chaired by **Carolyn Cairns**, Consumers Union
Vignettes about real-world experiences help to inform the discussions in the breakout sessions

Exposure Measurements – **Chuck Geraci**, NIOSH

Characterization obstacles – **Don Baer**, PNNL

International Alliance for NanoEHS Harmonization – **Alison Elder**, University of Rochester

Charge to Breakout Sessions – Sally Tinkle, NIEHS

Break

10:30-12:15 **Concurrent Breakout Sessions**

Framework Strategy Analysis Discussion
Sessions build upon the previous day to identify solutions for gaps and barriers, establish a timeline for the research needs, and develop milestones

Session 4: Characterization
Co-Chairs David Castner (University of Washington) and Vicki Grassian (University of Iowa)

Session 5: *In vitro* – biological – associated instrumentation
Co-Chairs Charles Gause (Luna Innovations) and Nancy Monteiro-Riviere (NC State)

Session 6: *In vivo* – biological – associated instrumentation
Co-Chairs Steve Roberts (University of Florida) and Joel Pounds (PNNL)

12:30 **Working Lunch** *(location: Rosslyn Ballroom, lunch will be provided)*

Introductions - **Amit Kulkarni**, GE Global Research

Nanoinformatics: *Data-Enabled Predictive Modeling for nanoEHS*

Martin Fritts, Nanoscale Characterization Laboratory
Justin Teeguarden, PNNL

1:45-3:00 **Closing Session** *(location: Rosslyn Ballroom)*

Public Comment Facilitated by **Bill Kojola**, AFL-CIO and **Ken Vest**, NNCO
To sign up to make a public comment or send in written comments, email humanhealth@nnco.nano.gov or mail to NNCO, 4201 Wilson Blvd Stafford II Suite 405, Arlington, VA, 22230

Report Out & Summary Chaired by **David Castner**, University of Washington
Summary of the thoughts from the three breakout sessions, and audience comments on research needs and framework strategy

Invited Presentation
Introduction by **Charles Gause**, Luna Innovations
Congressional Remarks on Nanotechnology Health and Safety

Next Steps & Final Thoughts
Looking to the future - **Sally Tinkle** (NIEHS) and **Dianne Poster** (NIST)

Invited Experts:
Don Baer, Pacific Northwest National Laboratory
Alison Elder, University of Rochester
Martin Fritts, Nanotechnology Characterization Laboratory
Charles Geraci, NIOSH
David Grainger, University of Utah
Vicki Grassian, University of Iowa
Eric Grulke, University of Kentucky
Tom Kalil, White House Office of Science & Technology Policy
Andrew Maynard, Woodrow Wilson Center for International Scholars
Scott McNeil, Nanotechnology Characterization Laboratory
Nancy Monteiro-Riviere, NC State
Michele Ostraat, RTI International
Günter Oberdörster, University of Rochester
Martin Philbert, University of Michigan
Richard Pleus, Intertox
Joel Pounds, Pacific Northwest National Laboratory
Justin Teeguarden, Pacific Northwest National Laboratory
Kim Williams, Colorado School of Mines

Workshop Planning Team:
Carolyn Cairns, Consumers Union
David Castner, University of Washington
Charles Gause, Luna Innovations
Bill Kojola, AFL-CIO
Amit Kulkarni, GE Global Research
Dianne Poster, NIST
Steve Roberts, University of Florida
Sally Tinkle, NIEHS